ABSTRACT OF DISCLOSURE

Disclosed is a method for forming a contact plug using a two-step epitaxial silicon growth process in which a first portion of epitaxial silicon is grown as single crystal silicon and the remainder of the contact plug is grown as polycrystalline or amorphous silicon. Preferably, the epitaxial silicon is grown using a LPCVD process at a temperature of 550°C to 700°C on a portion of the silicon substrate exposed at the bottom of a contact hole formed in an insulating layer, after the exposed portion of the silicon substrate has been cleaned and baked under H_2, with the epitaxial single crystal silicon covering the entire exposed portion of the silicon substrate, thereby reducing contact resistance and improving reliability.